National Air Toxics Assessment (NATA) & Residual Risk Update

EPA Region1

Science of Environmental Justice Workshop

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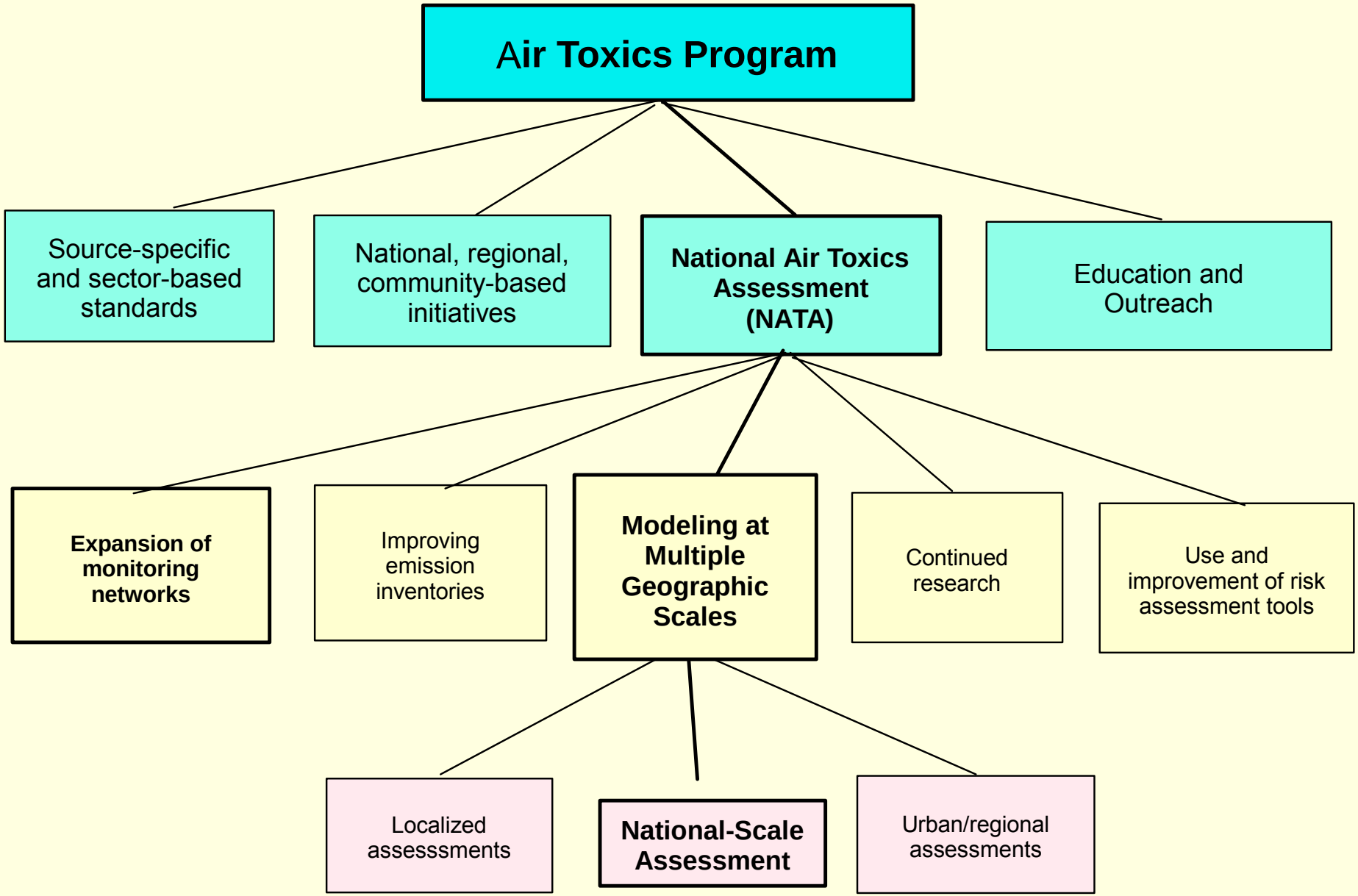
May 26, 2004

Outline

- What is the NATA
  - Why did we do it
  - What did the assessment consist of
  - What were the results of the 1996 Assessment
  - What are the results looking like in the 1999 Assessment
- What is the Residual Risk Program
  - Where do we stand
  - What are the results looking like


Air Toxics Program
Source-specific and sector-based standards
National, regional, community-based initiatives
National Air Toxics Assessment (NATA)
Education and Outreach
Expansion of monitoring networks
Improving emission inventories
Modeling at Multiple Geographic Scales
Continued research
Use and improvement of risk assessment tools
Localized assesssments
National-Scale Assessment
Urban/regional assessments

Goals of the National-Scale Assessment

- Tool for EPA and States/Locals/tribes
- Identify air toxics of greatest concern
- Characterize contributions of different emission sources to exposure and risk
- Prioritize collection of new data
- Provide a baseline (with ambient data) to track trends and measure progress against goals
- By itself, the assessment is **NOT** being used as the basis for specific regulatory decisions

National-Scale Assessments

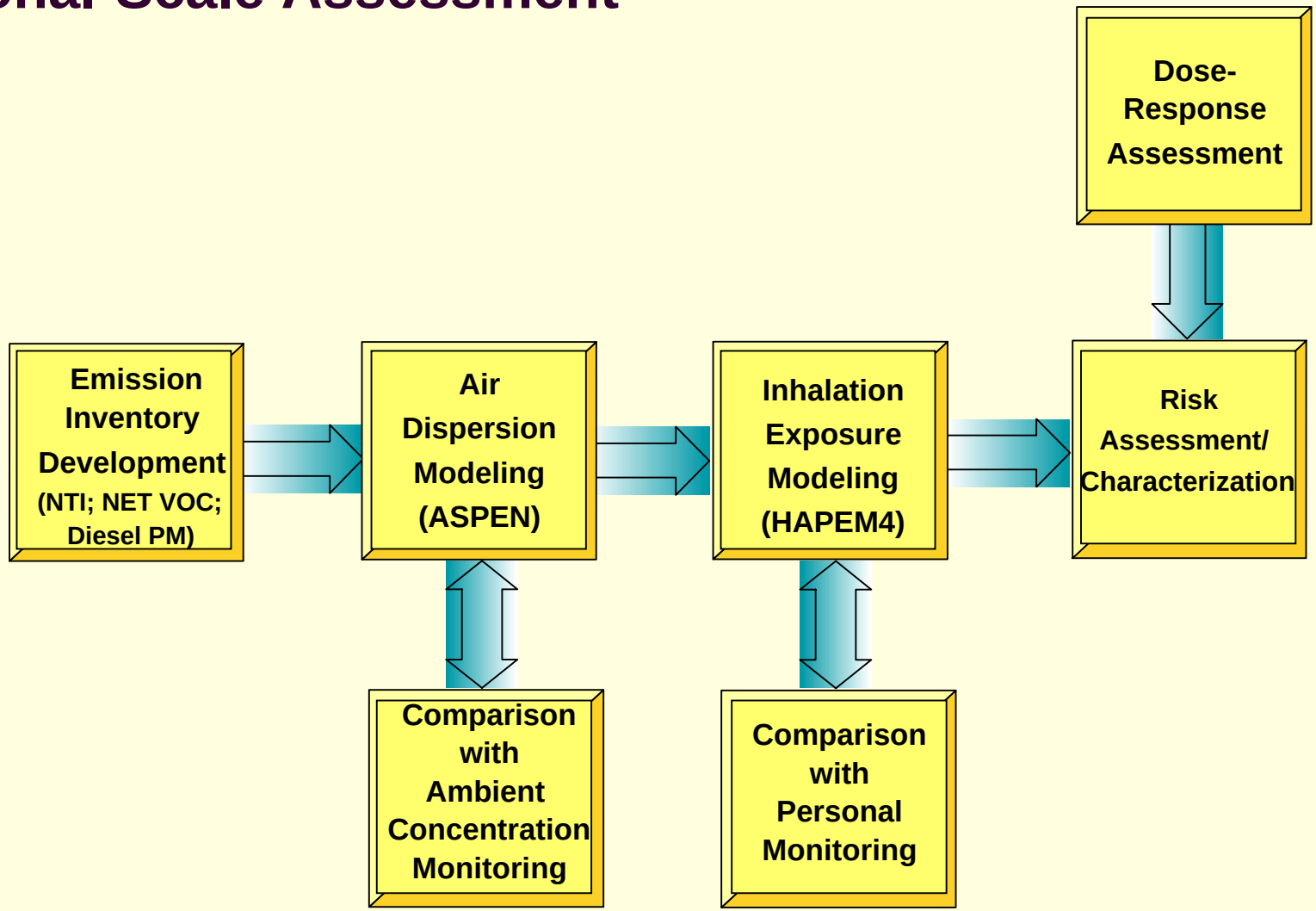
1996 Assessment

- Inhalation exposure **only**
- Chronic exposures **only**
- 1996 emissions data
- 48 states, VI, PR
- Sources of indoor origin **excluded**
- 50-km range
- Focuses on average/median exposures, not individual extremes
- Census tract-level calculations; county-level and higher presentations
- 32 urban HAPs & diesel PM
- Released in May 2002 to public

1999 Assessment

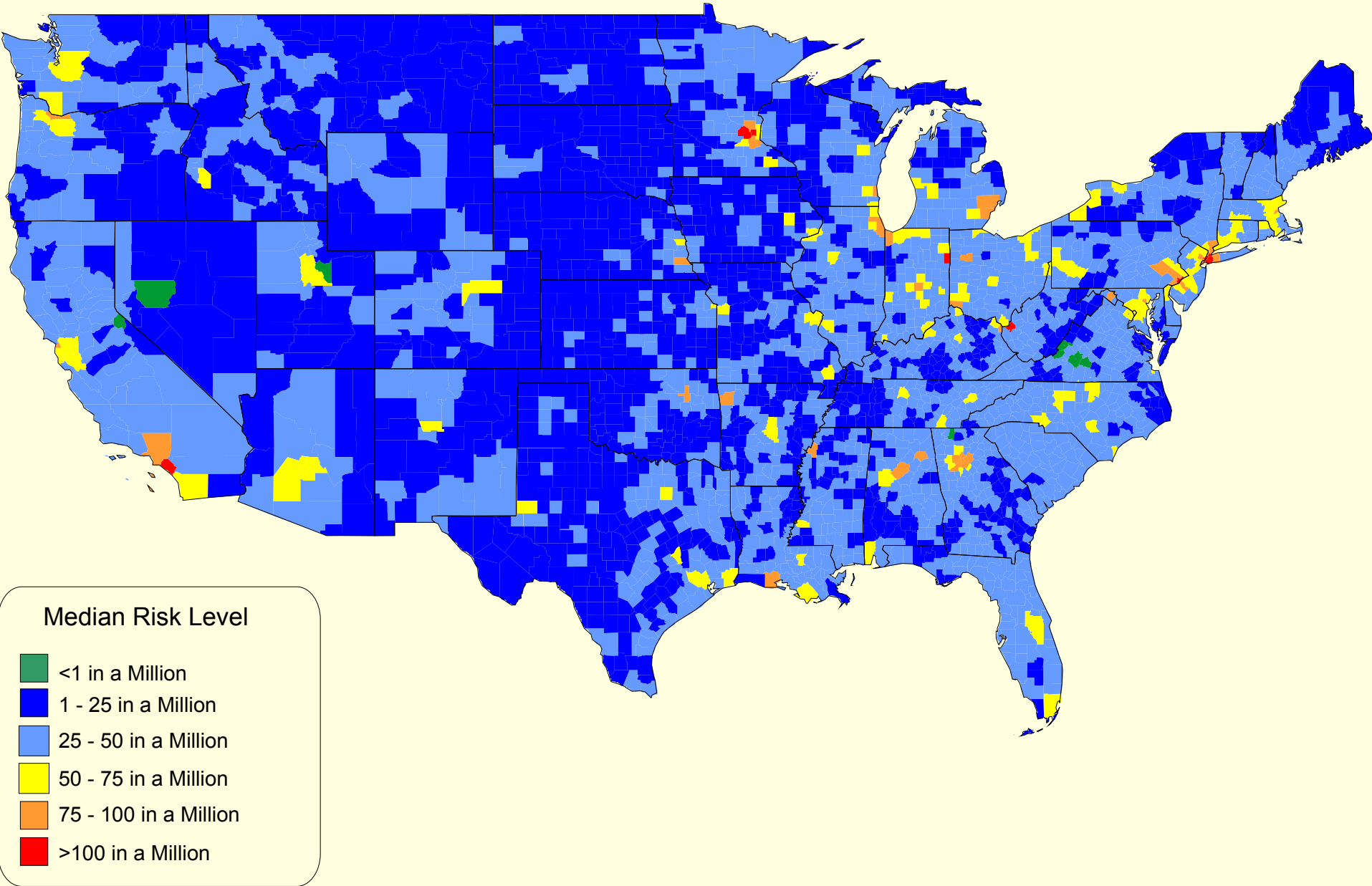
- Inhalation exposure **only**
- Chronic exposures **only**
- 1999 emissions data
- 50 states, VI, PR
- Some sources of indoor origin **included**
- 50-km range
- Focuses on average/median exposures, not individual extremes
- Census tract-level calculations; county-level and higher presentations
- **150** urban HAPs & diesel PM
- Expected release to public in late summer 2004

Components of the National-Scale Assessment



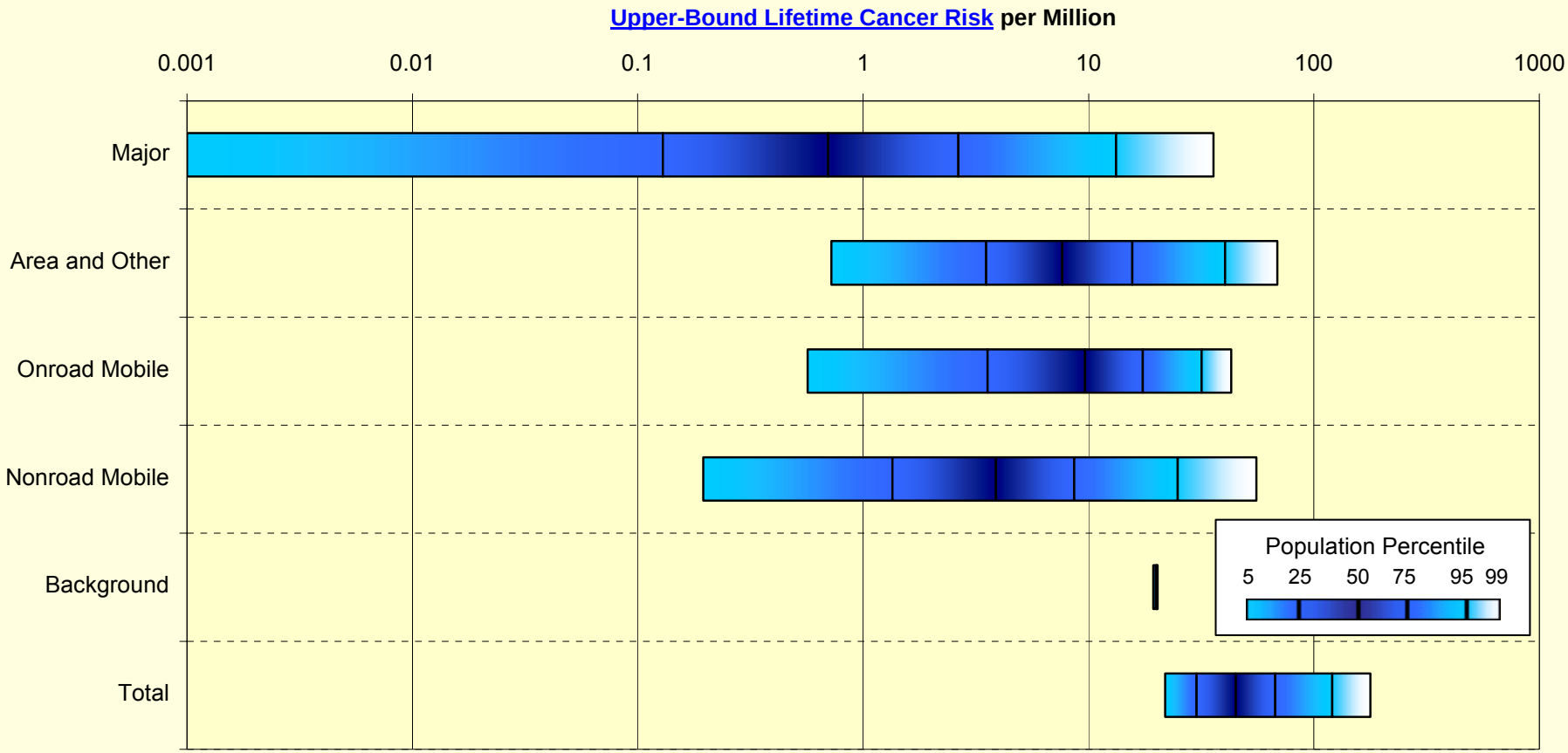
1996 National Scale Assessent

1996 NATA - National Scale Assessment
Predicted County Level Carcinogenic Risk



1996 Risk Characterization

Distribution of lifetime cancer risk for the US population, based on 1996* exposure to 29 carcinogenic air pollutants from various source sectors



** Results are based on inhalation exposure to outdoor sources only. Although these results assume continuous exposure to 1996 levels of air toxics over a lifetime, current and planned control programs are expected to substantially reduce these exposures and associated cancer risk for some pollutants. See additional information on the following page.*

Initial National-Scale Assessment Risk Characterization

- Cancer
  - National drivers[1]
    - Benzene
    - Chromium
    - Formaldehyde
  - Regional drivers[2]
    - Arsenic
    - 1,3-Butadiene
    - Coke oven emissions
    - POM
- Non-Cancer
  - National drivers[3]
    - Acrolein
  - Regional drivers[4]
    - Acetaldehyde
    - Arsenic
    - 1,3-Butadiene
    - Formaldehyde
    - Manganese

[1] Risk > 10 in 1 million to 25 million people
[2] Risk > 10 in 1 million to 1 million people OR Risk > 100 in 1 million to 10,000 people

[3] HQ > 1.0 to 25 million people
[4] HQ > 1.0 to 10,000 people

Initial National-Scale Assessment Risk Characterization

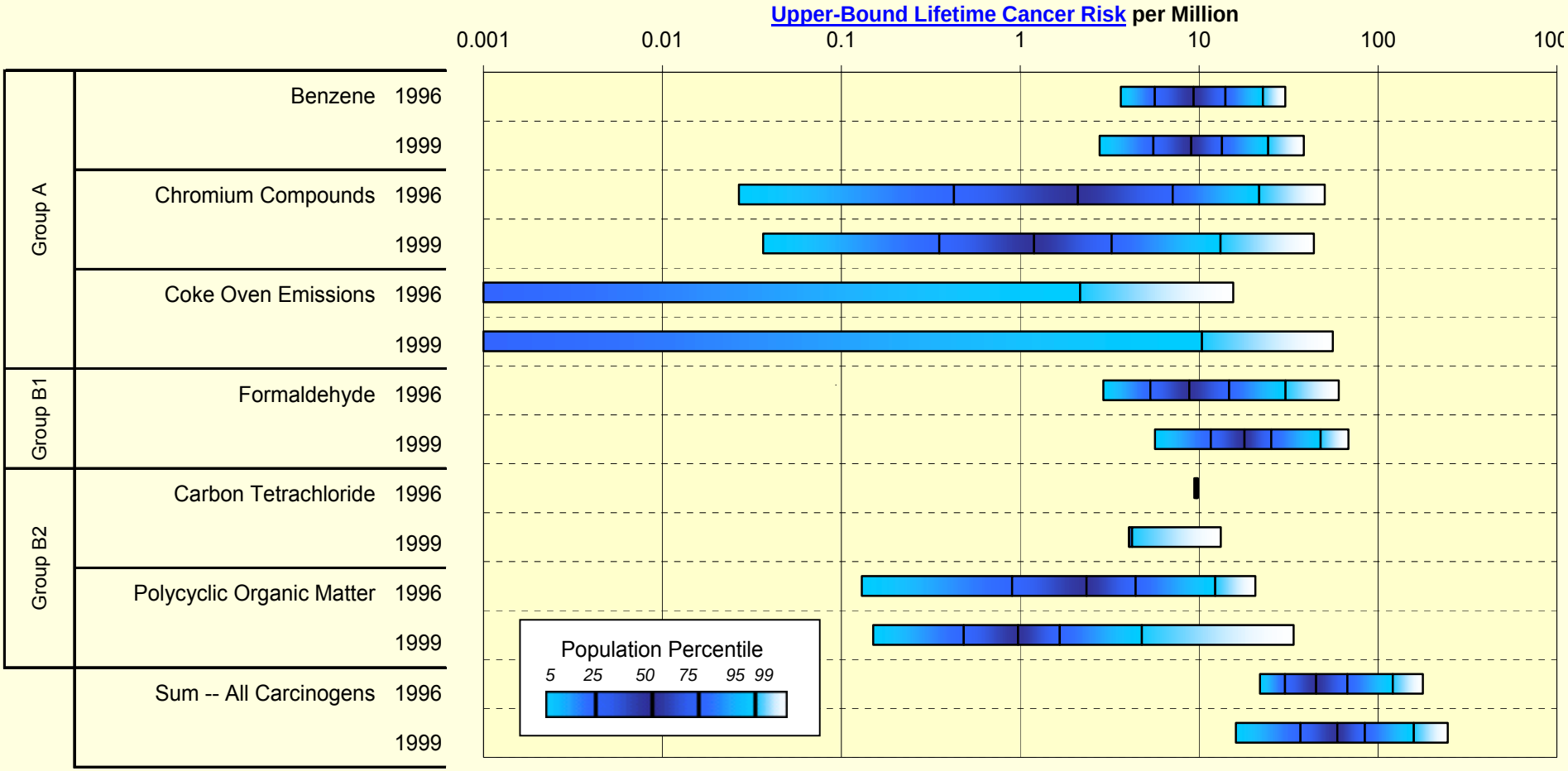
- **Limitations:**
  - It includes inhalation exposure only - some air pollutants (e.g., PCBs, mercury, lead) may pose significant risks by ingestion
  - It has low resolution – may not capture hot spots
  - Did not include a risk characterization for Diesel PM
  - Limited comparisons show substantial underprediction of ambient levels, especially for metals
  - It does not estimate individual extremes – only typical exposures

1999 National Scale Assessment

DRAFT

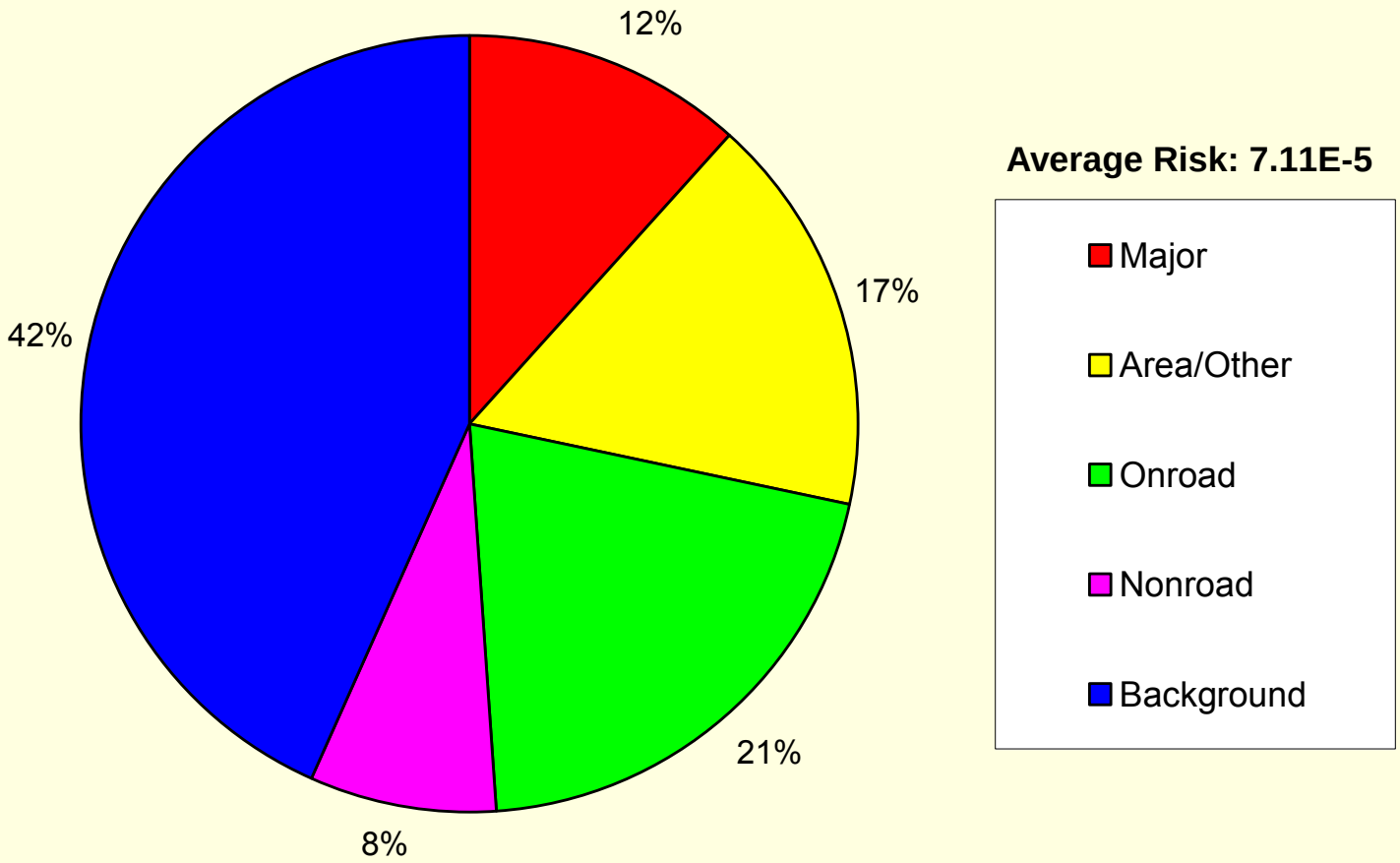
DRAFT: 1999 Risk Characterization

Distribution of lifetime cancer risk for the US population, based on ASPEN model estimates for all sources.



1999 NATA
Cancer Risk
Source Sector Contributions

DRAFT



1999 NATA
Noncancer (Respiratory) Risk
Source Sector Contributions

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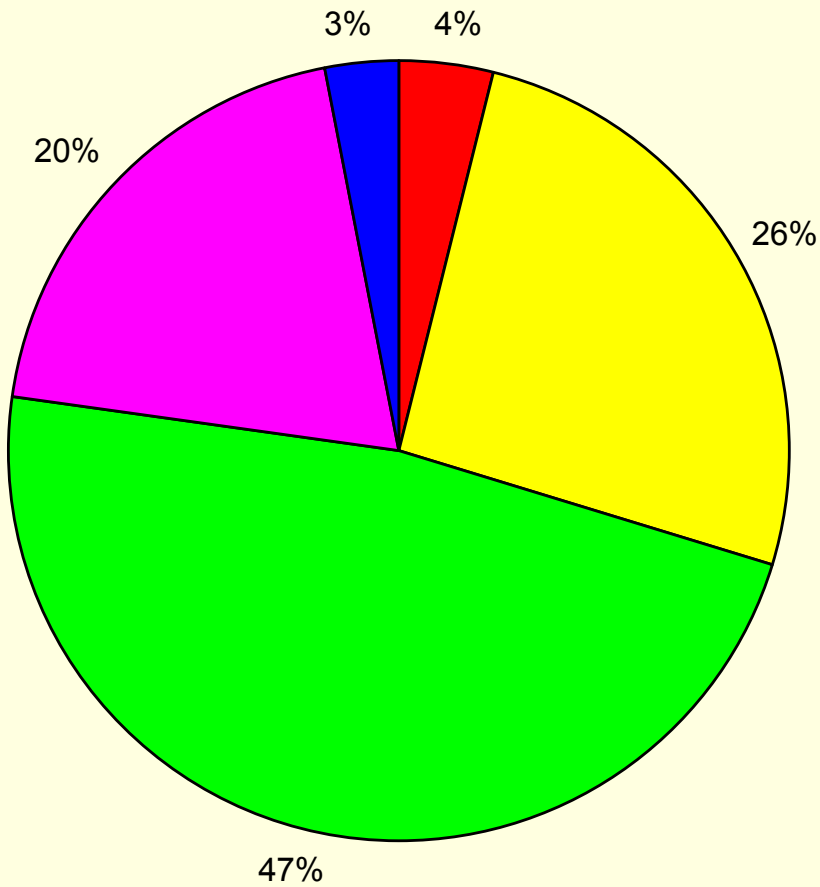
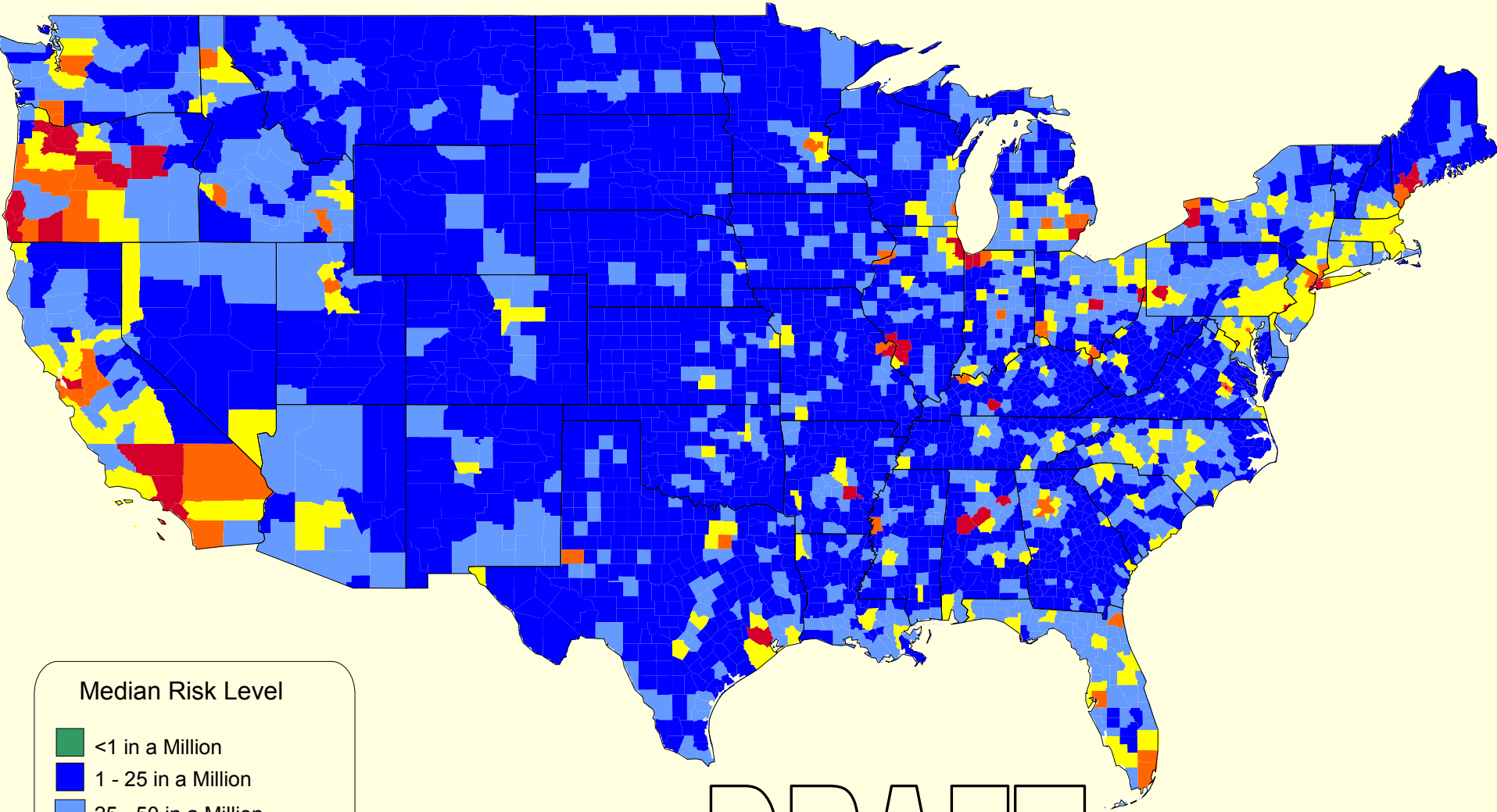


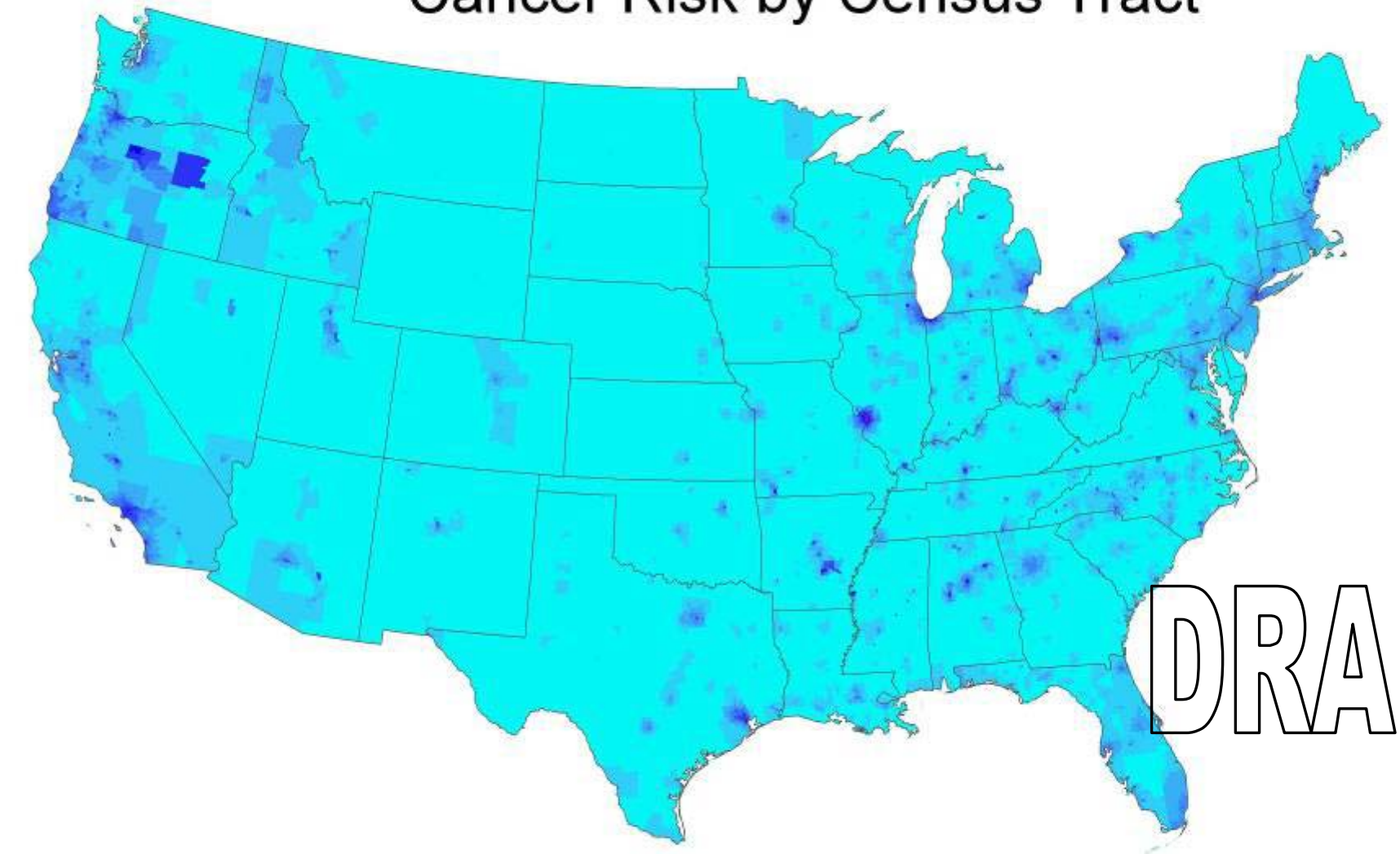
Average Risk: 6.56

- Major
- Area/Other
- Onroad
- Nonroad
- Background

1999 NATA - National Scale Assessment
Predicted County Level Carcinogenic Risk
(from ASPEN)



1999 National Air Toxics Assessment: Cancer Risk by Census Tract



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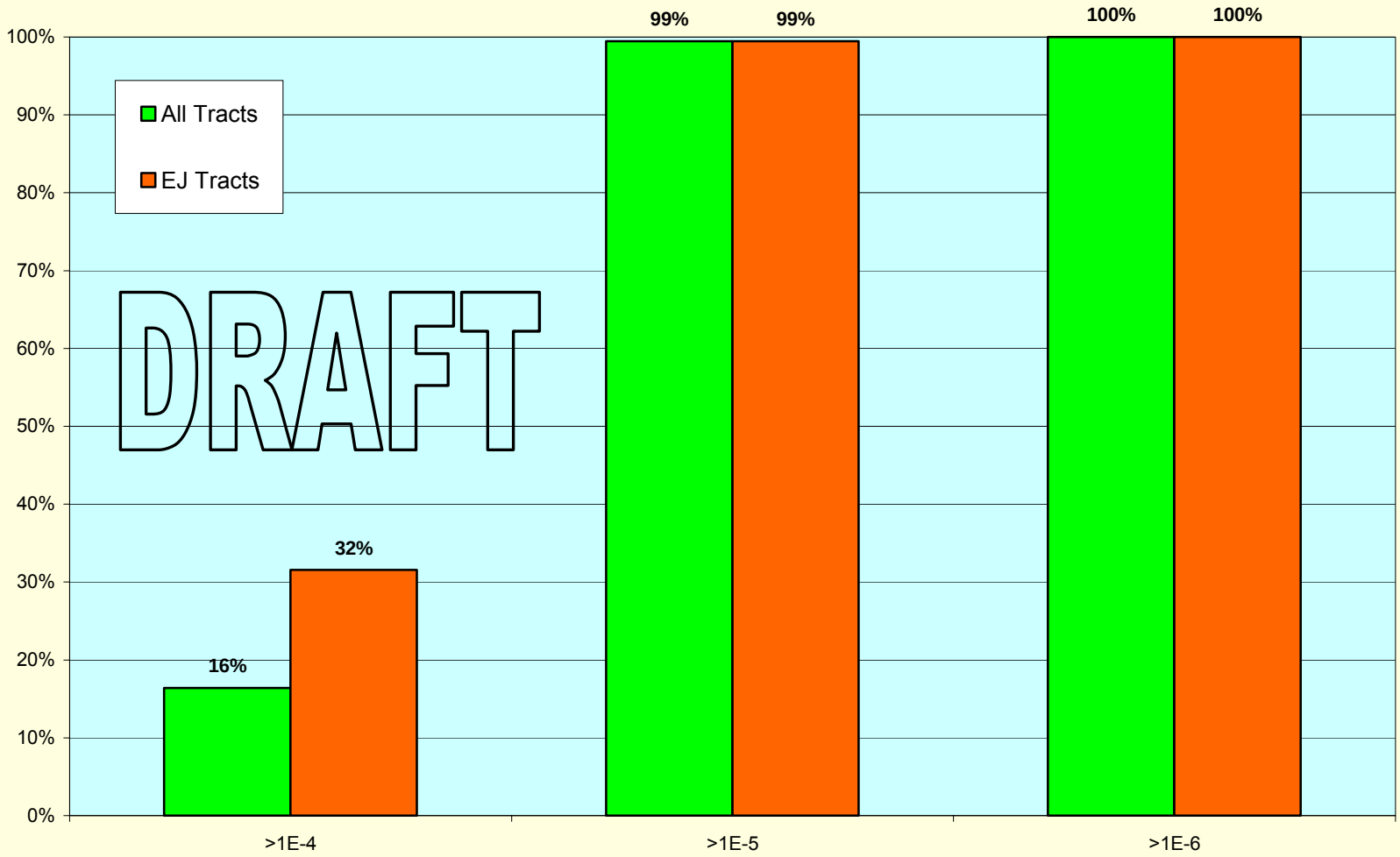
1999 NATA Comparison Between

All Census Tracts and HUD-designated "Qualified Census Tracts."



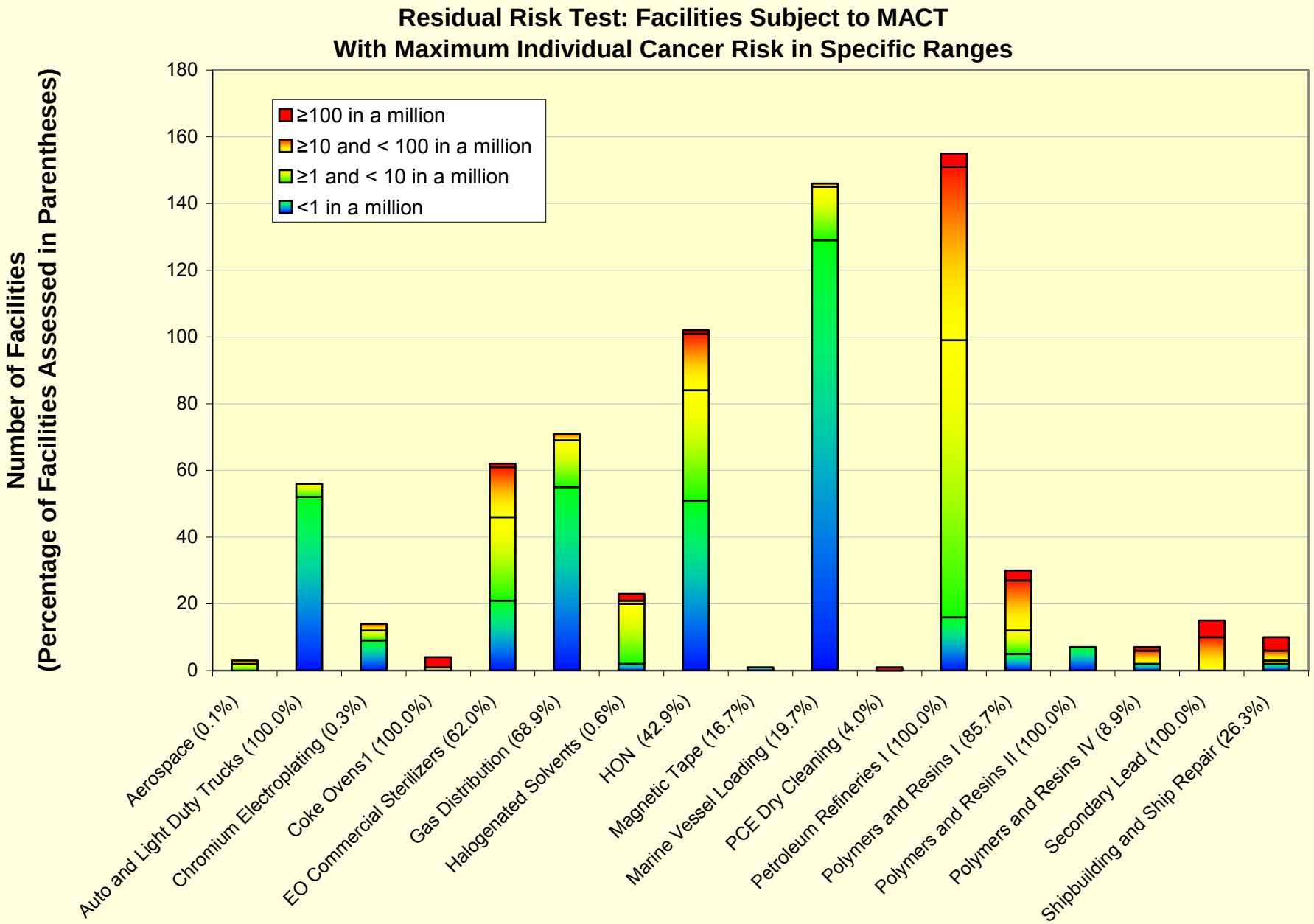
RESIDUAL RISK

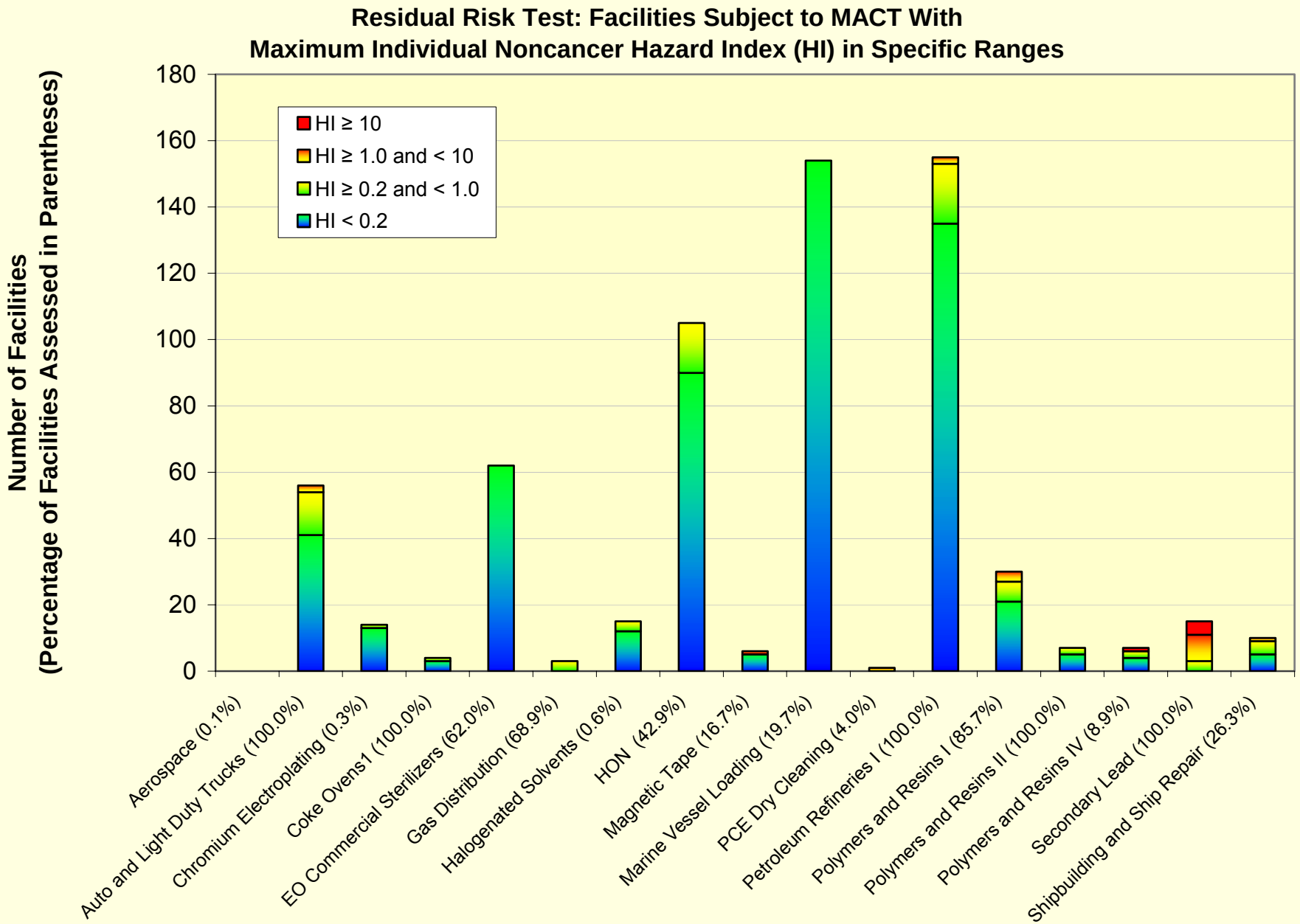
Mandate From Congress

- Assess risks from stationary sources that emit air toxics after technology-based (MACT) standards are in place
- Set additional standards if MACT does not protect public health with an “ample margin of safety”
- Set additional standards if necessary to prevent adverse environmental effects
- Review existing MACT and revise as appropriate

Overview of Where We are Now

- Volumes I and II of Risk Assessment Library are complete
- All 20 of the two- and four-year MACT residual risk standards have been started
- Five of the 24 seven-year MACT projects have initiated work groups


Residual Risk Test: Facilities Subject to MACT
With Maximum Individual Cancer Risk in Specific Ranges
Number of Facilities
(Percentage of Facilities Assessed in Parentheses)
≥100 in a million
≥10 and < 100 in a million
≥1 and < 10 in a million
<1 in a million
180
160
140
120
100
80
60
40
20
0
Aerospace (0.1%)
Auto and Light Duty Trucks (100.0%)
Chromium Electroplating (0.3%)
Coke Ovens1 (100.0%)
EO Commercial Sterilizers (62.0%)
Gas Distribution (68.9%)
Halogenated Solvents (0.6%)
HON (42.9%)
Magnetic Tape (16.7%)
Marine Vessel Loading (19.7%)
PCE Dry Cleaning (4.0%)
Petroleum Refineries I (100.0%)
Polymers and Resins I (85.7%)
Polymers and Resins II (100.0%)
Polymers and Resins IV (8.9%)
Secondary Lead (100.0%)
Shipbuilding and Ship Repair (26.3%)


Residual Risk Test: Facilities Subject to MACT With
Maximum Individual Noncancer Hazard Index (HI) in Specific Ranges
Number of Facilities
(Percentage of Facilities Assessed in Parentheses)
HI ≥ 10
HI ≥ 1.0 and < 10
HI ≥ 0.2 and < 1.0
HI < 0.2
0
20
40
60
80
100
120
140
160
180
Aerospace (0.1%)
Auto and Light Duty Trucks (100.0%)
Chromium Electroplating (0.3%)
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Shipbuilding and Ship Repair (26.3%)

Residual Risk (Continued)

- Complete current standards with court-ordered deadlines
  - Coke ovens – final 2005
  - Dry cleaning – final 2006
  - HON – final 2006*
  - Halogenated Solvents – final 2006*
- Complete 4 proposals of no further controls by end of 2006*
  - Industrial cooling towers
  - Magnetic tape
  - Ethylene oxide sterilizers
  - Gasoline distribution

*dates under negotiation

Challenges Facing Residual Risk Program

- Develop rules which target high-risk facilities in categories without impacting low-risk ones
  - Process should be simple, efficient
  - Process should be implementable by States
- Develop innovative ways to reduce risks where controls are not available
  - MACT may have been effective, yet risks may still be high

For More Information

Website for Air Toxics:

www.epa.gov/ttn/atw

Website for Risk Assessment Library:

www.epa.gov/ttn/fera/risk_atoxic.html